

REMARKS

Claims 1 – 10 are pending in the application. Applicants cancel claims 2 and 9 without prejudice or disclaimer, amend claim 1 to include in substantial part the limitations of canceled claim 2, amend claims 4 and 6 to be rewritten in independent form, and amend claim 7 to include in substantial part the limitations of canceled claim 9. No new matter is added. Support for the claim amendments may be found, for example, in Applicants' specification at page 14, line 8 through page 16, line 26 of Applicants' specification.

OBJECTED CLAIMS

Applicants thank the Examiner for indicating that claims 4 – 6, 8 and 10 are each objected to as being dependent on one of rejected base claims 1 and 7, but that each would be allowable if rewritten to include all of the limitations of its base claim and any intervening claims.

Applicants amend claims 4 and 6 accordingly. As claim 5 depends from amended claim 4, Applicants respectfully submit that claims 4 – 6 are therefore allowable.

Applicants amend claim 7 to further clarify the nature of their invention, and for the reasons cited below respectfully submit that amended claim 7 is allowable. As claims 8 and 10 depend from allowable claim 7, Applicants respectfully submit that claims 8 and 10 are allowable.

Accordingly, Applicants respectfully request that the objections to claims 4 – 6, 8 and 10 be withdrawn.

REJECTION UNDER 35. U.S.C. §§ 102, 103

Claim 1 is rejected under 35 U.S.C. § 102(b) as being unpatentable over U.S. Patent No. 5,715,276 to Tran et al. Claim 2 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Tran in view of U.S. Patent No. 5,966,411 to Struhsaker. Claim 3 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Tran. Claim 7 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Tran in view of U.S. Patent No. 6,094,449 to Komatsu. Claim 9 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Tran in view of Struhsaker and Komatsu. Applicants cancel claims 2 and 9 without prejudice or disclaimer, amend claim 1 to include in substantial part the limitations of canceled claim 2, amend claim 7 to include in substantial part the limitations of canceled claim 9, and respectfully traverse these rejections.

In amended independent claim 1, Applicants claim:

1. An apparatus, comprising:

a plurality of received-signal registers which receive and store therein a plurality of respective received-signal sequences;

a selector which selects one of the received signal sequences stored in said received-signal registers;

at least one code register which stores therein a de-spreading-code sequence;

a multiplication circuit which multiplies the selected one of the received-signal sequences by the de-spreading-code sequence; and

a summation circuit which obtains a sum of results of the multiplication to obtain a correlation between the selected one of the received-signal sequences and the de-spreading-code sequence;

wherein said at least one code register includes a first code register storing a first de-spreading code and a second code register storing a second de-spreading code, wherein the pattern of the first de-spreading code and the pattern of the second de-spreading code are different, and said apparatus further comprising a selector which selects one of said first code register and said second code register to select and supply the de-spreading-code sequence to the multiplication circuit.

Tran discloses an architecture for implementing a large-bit matched filter (see, e.g., abstract of Tran). With respect to original claim 2, the Examiner acknowledges that Tran fails to disclose Applicants' claimed at least one code register including a plurality of code registers storing a plurality of code de-spreading sequences, and a selector selecting one of the plurality of code registers to select and supply its code de-spreading sequence to the multiplication circuit. The Examiner however suggests that these elements are disclosed by Struhsaker.

Struhsaker discloses an equalization method based on a parallel correlator having a number of correlators 110 arranged in parallel providing codes 124 for correlation (see, e.g. column 1, lines 57 – 64 and column 5, lines 6 – 12 of Struhsaker). Unlike Applicants' claimed apparatus, Struhsaker suggests that the codes 124 may represent a single, common code sequence that for each of correlators 110 is simply phase adjusted (see, e.g., column 5, lines 12 – 19 of Struhsaker). In sharp contrast, Applicants disclose different codes $c_1(t)$, $c_2(t)$ that are time adjusted.

In addition, Struhsaker discloses correlators 110 operate in parallel, providing correlator outputs that are multiplied by complex weights to produce I tap and Q tap values for summation (see, e.g., column 5, lines 20 – 45 of Struhsaker). Thus, unlike Applicants claimed invention, Struhsaker fails to disclose or suggest a selector for selecting only one of the plurality of code registers to select and supply its code de-spreading sequence to the multiplication circuit. Moreover, unlike Applicants, Struhsaker and Tran fail to disclose or suggest using a single selection signal to select one of a plurality of code sequences and one of a plurality of received signal sequences, such that each of the selected code sequence and received signal sequence is appropriately matched to the other selection (see, e.g., page 14, line 32 – page 15, line 1 of Applicants' specification).

Accordingly, Applicants respectfully submit that amended independent claim 1 is not made obvious by the combination of Tran and Struhsaker.

In amended independent claim 7, Applicants claim:

7. An apparatus for obtaining a correlation wherein a correlation calculating unit calculates the correlation while shifting, relative to a de-spreading code, a phase of a received signal spread by a spreading code, comprising:

a first shift register configured to store a first received signal;

a second shift register configured to store a second received signal;

a selector unit configured to selectively output one of the first received signal and the second received signal; and

a control unit configured to cause said selector unit to output the first received signal and to cause the correlation calculating unit to calculate a correlation with respect to the first received signal, followed by causing said selector unit to output the second received signal and by causing the correlation calculating unit to calculate a correlation with respect to the second received signal;

wherein the first received signal is a signal spread by a first spreading code and the second received signal is a signal spread by a second spreading code, said apparatus further comprising:

a de-spreading code selecting unit configured to select a first de-spreading code corresponding to the first spreading code for correlation calculation of the first received signal, and to select a second de-spreading code corresponding to the second spreading code for correlation calculation of the second received signal, such that each of a pattern of the first spreading code and a pattern of the second spreading code are different.

As previously noted, Tran discloses an architecture for implementing a large-bit matched filter. Komatsu discloses a spread spectrum synchronization acquisition demodulating apparatus (see, e.g., abstract of Komatsu). With regard to independent claim 7, the Examiner acknowledges that the combination of Tran and Komatsu fails to disclose Applicants' claimed first received signal spread by a first spreading code, second received signal spread by a second spreading code, and de-spreading code selecting unit configured to select a first de-spreading code corresponding to the first spreading code and a second de-spreading code corresponding to the

second spreading code. Again, the Examiner suggests that these elements are disclosed by Struhsaker. Applicants reapply the arguments made above for amended independent claim 1 regarding Struhsaker, and respectfully submit that amended independent claim 7 is not made obvious by the combination of Tran, Komatsu and Struhsaker.

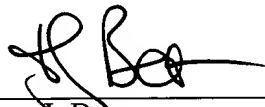
Accordingly, Applicants respectfully submit that independents claim 1 and 7 are not anticipate or made obvious by the cited references, and are therefore in condition for allowance. As claim 3 depends from allowable claim 1, Applicants respectfully submit that claim 3 is also allowable for at least this reason.

CONCLUSION

An earnest effort has been made to be fully responsive to the Examiner's objections. In view of the above amendments and remarks, it is believed that claims 1, 3 – 8 and 10, consisting of independent claims 1, 4, 6, and 7, and the claims dependent therefrom, are in condition for allowance. Passage of this case to allowance is earnestly solicited. However, if for any reason the Examiner should consider this application not to be in condition for allowance, she is respectfully requested to telephone the undersigned attorney at the number listed below prior to issuing a further Action.

Any fee due with this paper may be charged on Deposit Account 50-1290.

Respectfully submitted,



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